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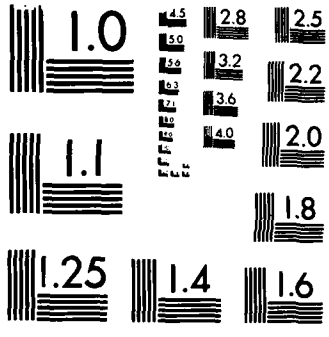

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DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

IN REPLY REFER TO

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From: Commandant of the Marine Corps

Subj: REQUIRED OPERATIONAL CAPABILITY (ROC) NO. LOG 216.2.1 FOR A MECHANICAL CALIBRATION AND REPAIR FACILITY (MCRF)

Ref: (a) MCO 3900.4C

Encl: (1) ROC No. LOG 216.2.1

1. In accordance with the procedures set forth in the reference, ROC No. LOG 216.2.1 for a Mechanical Calibration and Repair Facility (MCRF) is hereby established and promulgated.

2. The Commanding General, Marine Corps Development and Education Command (Director, Development Center), Quantico, Virginia 22134 is the Marine Corps point of contact for any questions pertaining to this ROC and any development efforts pertaining thereto.

Distribution:
See attached

RAY "M" [illegible]
Major General, U.S. Marine Corps
Deputy Chief of Staff for R,D&S

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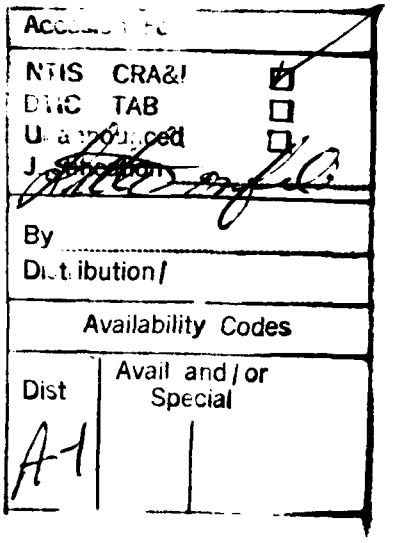

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ROC-08-14

REQUIRED OPERATIONAL CAPABILITY (ROC) NO. LOG 216.2.1 FOR A MECHANICAL CALIBRATION AND REPAIR FACILITY (MCRF)

1. STATEMENT OF THE REQUIREMENT

a. The Marine Corps has a requirement for a Mechanical Calibration and Repair Facility (MCRF) capable of providing a calibration and repair capability to the Fleet Marine Forces (FMF's). It will be used by the Force Service Support Group (FSSG), Marine Wing Communications Squadron (MWCS) and the Brigade Service Support Group (BSSG) to perform fourth echelon maintenance in both garrison and expeditionary environments. The MCRF will consist of required mechanical test, measurement, and diagnostic equipment (TMDE) and will be housed in a Marine Corps Expeditionary Shelter System (MCESS) shelter.

b. An initial operational capability (IOC) is required during FY87. The desired date for full operational capability (FOC) is FY88.

2. THREAT AND/OR OPERATIONAL DEFICIENCY

a. Threat. Potential enemy threats confronting the United States in the near-to-long-range period are described in the Marine Corps Long Range Plan (MLRP) of May 1982 and the Marine Corps Mid-Range Objective Plan (MMROP) of 29 April 1983. To successfully counter predicted threats, the Marine Corps, as a force in readiness, must be capable of a quick response, organized and tailored for general and specific mission needs. The success of combat operations, at any level of intensity, is directly dependent upon the degree of efficiency and effectiveness of the operational logisitic support provided. The ability to communicate, maneuver, and coordinate/direct fires on the enemy can only be assured if the sophisticated weapons and equipment employed by the commander are supported by mechanical TMDE which is both operable and accurately calibrated. It is imperative that his equipment receive timely and efficient calibration and repair.

b. Operational Deficiency. Manpower shortages currently being experienced by the FMF's in many technical fields can be expected to continue for the forseeable future. These shortages combined with deficiencies within the existing MCRF impact on the FMF's ability to provide timely calibration and repair for mechanical TMDE. The increasingly sophisticated weapons systems employed in the FMF's require precise mechanical TMDE for support which, in turn, require more sophisticated and complex calibration and repairs. These ever increasing requirements place demands on the current MCRF which are beyond its capability to support effectively with outdated equipment. This situation has created a technological gap which prevents efficient and

timely calibration and repair of mechanical TMDE. The current MCRF was fielded in 1972. It has become obsolete because of the increased precision required and the volume of TMDE that requires calibration and repair in the FMF's.

3. OPERATIONAL AND ORGANIZATIONAL CONCEPT

a. Operational Concept

(1) The MCRF will be utilized within the FSSG and MWCS to support the the current and projected mechanical calibration and repair requirements for the FMF's between the late 1980's and late 1990's. The functions which will be performed at these organizations are:

(a) Calibration and repair of mechanical TMDE.

(b) Management of an instrument calibration procedure and repair manual library.

(c) Shipment and receipt of equipment in the calibration or repair cycle.

(d) Storage of organic and unit equipment.

(e) Maintenance management and administration functions.

(2) The MCRF must be designed and developed in a fashion which permits the calibration or repair capability to be:

(a) Modernized and continually updated to keep pace with technological advances made by civilian industry in the field of mechanical calibration and repair equipment.

(b) Task configured for the various roles required under the combat service support concept.

(3) The special requirement for calibration traceability of calibration standards will be provided via the Navy Calibration Program or the Marine Corps Standards Exchange Program (MCSEP).

b. Organizational Concept. The MCRF will be utilized and deployed by the FSSG, MWCS, and BSSG without special handling equipment requirements. It is estimated that 12 MCRF's of varying configurations will be required. Distribution is as follows:

(1) FSSG's	1 ea	Total 4
(2) MWCS's	1 ea	Total 4
(3) Maint Co. BSSG	1 ea	Total 1

(4) MCAGCC, 29 Palms	1 ea	Total 1
(5) Maint Float, MCLB, Barstow	1 ea	Total 1
(6) Maint Float, MCLB, Albany	1 ea	Total 1

4. ESSENTIAL CHARACTERISTICS

a. The MCRF shall:

(1) Be able to calibrate and repair mechanical TMDE in the following areas:

(a) Dimensional.

(b) Pressure.

(c) Vacuum.

(d) RPM (revolutions per minute).

(e) Temperature.

(f) Mass.

(g) Force.

(h) Flow.

(i) Torque.

(2) Operate in climatic design categories I through IV, as defined in AR 70-38, without degradation of capabilities.

(3) Operate with 50-60 Hz prime power.

(4) Be designed for installation and operation in the Marine Corps electronic maintenance complex (EMC).

(5) Consist of a series of independent work stations configured to satisfy the measurement areas identified in paragraph 4a(1).

b. A pre-planned product improvement (P3I) goal is to modernize the individual MCRF work stations so as to stay abreast of state-of-the-art equipment or to meet new requirements. NBC requirements such as an overpressure system, should also be considered.

c. Suitability Objectives

(1) Reliability. Each work station will have a minimum mean-time-between-failure (MTBF) of 500 hours. Work station failure is defined as any departure from the required performance or operations outside of the required accuracies (not correctable by normal use of the operating controls), or deviation from the criteria of the test after it is initiated.

(2) Availability. Each work station will have a minimum operational availability of 90 percent for sustained (90 days) field of garrison operation.

(3) Maintainability. Each work station will have a maximum maintenance ratio of active maintenance man-hours to operational man-hours of 0.05. This includes all scheduled and unscheduled maintenance at all levels. The mean-time-to-replace (MTTR) a malfunctioning instrument will not exceed 15 minutes, with the maximum replacement time not to exceed 45 minutes (90 percent confidence). Warm up stabilization time and administrative logistics down time (ALDT) are not a part of the MTTR considerations.

(4) Transportability. Transportability is provided via the MCESS shelter which houses the facility.

(5) Vulnerability. The MCRF must be capable of providing the full range of support, without disruption of service or function for a minimum of 16 hours/day for 90-day periods in the field. This excludes disruptions of service caused by inadvertent or accidental damages not incurred as a result of normal handling or operation.

(6) Survivability. It is necessary that the MCRF be capable of continuous operation in an environment which has been contaminated by NBC attack. This capability, however, will be primarily driven by personnel precautions and/or protective measures which are external to the MCRF.

5. INTRA/INTEROPERABILITY AND STANDARDIZATION REQUIREMENTS

a. Intra/Interoperability. The MCRF must be compatible with the EMC (TAM No. A0889) and will consist of modules tailored to the mission requirements.

b. Standardization. This system will consist of standard off-the-shelf commercial test equipment. The test equipment with associated internal appointment modules will be placed in the EMC shelter.

c. Warfare/Mission Areas. The introduction of this system will primarily affect the logistics support mission area. It is anticipated that the fielding of this system will have a negligible effect upon other functional categories.

6. RELATED EFFORT

a. Marine Corps ROC No. LOG 1.20 for the MCESS. The MCRF will use shelters approved under the MCESS Program.

b. This ROC will address only the mechanical calibration equipment to be used in the new MCRF. The shelter is addressed separately in ROC No. LOG 1.51 for an EMC.

7. TECHNICAL FEASIBILITY AND ENERGY/ENVIRONMENTAL IMPACTS

a. Technical Feasibility. The development of an MCRF is technologically feasible using the basic shelters developed under the MCESS program, the design efforts of the EMC program, and commercially available test equipment. Technical risk is considered to be low.

b. Energy/Environmental Impact. This program will not adversely impact upon energy critical materials.

8. LIFE CYCLE COST FORECAST. See annex A.

9. MANPOWER REQUIREMENTS. The introduction of the MCRF into the Marine Corps inventory can be accomplished within the exsting manpower structure. This is a new item for the MWCS, and will require a table of organization (T/O) increase of one metrology technician, sergeant, MOS 2874. This T/O increase can be accomplished by an offset T/O reduction of MOS 287X within the supporting MCAS, which has no calibration capability.

10. TRAINING REQUIREMENTS. Because the MCRF work stations will consist of commercial off-the-shelf TMDE, additional training will be confined to new concepts in mechanical calibration and repair. These new concepts can be included as a part of the calibration course at Lowry AFB, Denver, Colorado. If a new item is procured which differs greatly from those items in the training syllabus, the school will have to modify the curriculum.

11. AMPHIBIOUS/STRATEGIC LIFT IMPACT. The impact upon tactical and strategic mobility for the FSSG and the BSSG will be no increase in cube, and an increase from 11,000 lbs to 14,000 lbs (an increase of 27 percent) in weight. The impact on the MWCS will be an increase in 1280 cu ft in cube and an increase of 14,000 lbs in weight.

ANNEX A

Major System: Mechanical Calibration & Repair Facility | Date: [illegible]

LIFE CYCLE COST FORECAST

FUNDING PROFILE
(Thousands of [illegible] Constant Budget Dollars)

[illegible] YEAR LIFE CYCLE

	PRIOR YEARS	CURRENT YEAR	BUDGET YEAR	FY87	FY88	FY89	FY90	FY91	TO COMPLETE	TOTAL PROGRAM
Major System										
RDT&E	[illegible]	104	9[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
OTHER FUNDED	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]
Support										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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TOTAL PROGRAM		104	9[illegible]	[illegible]	79	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

This document should not be associated with any POM or FYDP budget document. The "To Completion" column represents the difference between the funding stream (established or proposed) and the Total Life Cycle cost of the program by appropriation.

Major System: Mechanical Calibrator & Repair Facility Date: 01-01-1985

LIFE CYCLE COST ESTIMATE

(In Thousands of FY85 Constant Budget Dollars)

10 YEAR LIFE CYCLE

PHASE CATEGORY	SUBCATEGORY	CATEGORY	PHASE
I. ROTSE PHASE			152
II. INVESTMENT PHASE			4,028
1. SYSTEM PRODUCTION/PROCUREMENT		3,944	
A. Major End Item (Contractor)	3,936		
B. Initial Provisioning Spares, Repair Parts	0		
C. Government Furnished/Added Equipment	0		
D. Other Direct System Costs	36		
2. SUPPORT EQUIPMENT PROCUREMENT		84	
A. Ammunition	0		
B. Weapons and Tracked Combat Vehicles	0		
C. Guided Missiles	0		
D. Comm-Elec Equipment	0		
E. Support Vehicles	0		
F. Engineer and Other Equipment	84		
3. MILITARY CONSTRUCTION		0	
III. OPERATIONS AND SUPPORT PHASE			2,150
1. OPERATIONS		899	
A. Operator Personnel/Training	0		
B. Material Consumption	0		
C. Energy Consumption	899		
2. MAINTENANCE		1,099	
A. Organizational Maintenance	0		
1) Personnel/Training	0		
2) Maintenance Material	0		
3) Repair Material	0		
4) Other	0		
B. Intermediate Maintenance	0		
1) Personnel/Training	0		
2) Maintenance Material	0		
3) Repair Material	0		
4) Other	0		

There is a cost not clearly known at this time which accounts for replacement of test equipment as it wears out and repair of workbenches, storage bins, and misc. modular components. An attempt to capture this factor is in the overhaul costs shown above.

C. Depot Repair	0		
D. Depot Overhaul	1,099		
E. Unprogrammed Losses	0		
F. Software Maintenance	0		
3. INDIRECT SUPT, BASE OPS & MAINT, OTHER O/H COSTS		94	
A. Base Operations	94		
B. Other Overhead Costs	0		
4. SUPPORT EQUIPMENT O&S		42	
TOTAL LIFE CYCLE COSTS			6,376

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